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The influence of management structure on the performance of Fund of Funds

Abstract

A rapidly growing mutual fund category is Fund of Funds (FOFs), which invest in other mutual funds instead of individual securities. This study reports on FOFs' characteristics and performance relative to traditional equity mutual funds and finds that FOFs compare favorably. In particular, FOFs with identified managers outperform their unidentified counterparts, and FOFs that invest in-family outperform both traditional equity funds and those FOFs investing out-of-family. Finally, replicating FOFs' holdings can be prohibitively expensive since they commonly hold funds with high minimum initial investments, closed funds and/or funds that are restricted to a particular investor type.

Keywords: fund of funds, mutual fund management, mutual fund performance

JEL Classification: G11

The influence of management structure on the performance of Fund of Funds

1. Introduction

Over the past decade the mutual fund industry has experienced rapid growth in a category of mutual funds known as Funds of Funds (FOFs). These funds distinguish themselves by investing in shares of other mutual funds rather than buying individual securities, thus providing a unique opportunity to examine several relevant issues regarding mutual fund management, services and performance. In particular, this paper analyzes the characteristics of FOFs to determine whether or not they provide significant investor benefits including enhanced performance due to management expertise and/or better risk return trade-offs than traditional mutual funds. We also discuss the feasibility and cost of replicating a FOFs' portfolio strategy.¹

In addition to offering the same advantages as traditional mutual funds, FOFs offer instant diversification across different fund companies and managers. FOFs expand investment opportunities by providing a mechanism for investing in those traditional funds with high minimum initial investments and funds that are closed, as well as funds that might otherwise be restricted to a specific investor type (i.e. institutional investors). In terms of management expertise, FOFs enable investors to access foreign funds and create portfolios of top-quality managers whereby investors gain from embedded and affordable advice. Managers also have greater flexibility in reacting to changing market conditions due to the unique composition of FOFs. Finally, when an investor selects a FOFs the individual fund selection dilemma is easily resolved.

¹ The term 'fund of funds' is frequently used to describe hedge fund activity and investing in funds of hedge funds. This paper does not include an analysis of these fund types.

Alternatively, FOFs potentially involve certain costs and create other disadvantages to the investing public. For instance, the process of investing in FOFs necessarily adds another layer of fees and expenses, and with traditional mutual funds already under fire for excessive costs, FOFs may be seen as prohibitively expensive. Additionally, the diversification advantage across fund companies and managers diminishes when FOFs invest in only one fund or within one family of funds. In such cases FOFs are seen as more of a marketing tool for the fund family thus proliferating their offerings in an attempt to keep business in-house. Conversely, FOFs may argue that their knowledge of in-house managers, in comparison to lesser known outsiders, enhances their ability to find top performers.

This paper will address these competing arguments by analyzing the performance and other basic characteristics of FOFs. In doing so, we first present the overall descriptive statistics for a sample of FOFs in comparison to traditional mutual funds and then summarize the relevant risk-adjusted performance data for these funds. Further analyses within the FOFs' sample consider the impact of diversification, management expertise and expenses on FOFs' performance. Given the rapid growth and apparent significant benefits for this category of funds, our analyses may shed some light on whether FOFs' popularity is justified.

Our results suggest that FOFs do offer diversification benefits to investors at both the fund company and manager level, and FOFs perform as well as, and in some cases better than traditional equity mutual funds with similar investment objectives. Management expertise influences performance since FOFs with identified team managers perform better than those FOFs with unidentified teams. In addition, in-

family FOFs outperform those investing out-of-family and also the traditional equity funds. Finally, based on the inaccessibility of closed funds and funds with large minimum initial investments, FOFs provide an investment vehicle, which cannot be replicated.

The remainder of the paper proceeds as follows. Section 2 provides a review of the literature and a discussion of growth trends in the mutual fund market. Section 3 presents the descriptive statistics of the FOFs' sample and two different equity fund samples. Section 4 defines the measures used for evaluating the impact of management and the effect of in-family versus out-of-family diversification on fund performance. Section 5 presents a summary of results and conclusions.

2. Literature review and market trends

Prior literature on traditional mutual fund performance is quite extensive beginning with the early works of Treynor (1965), Sharpe (1966) and Jensen (1968), which suggest that mutual funds don't beat the market. In providing a summary of the early performance related mutual fund literature, Ippolito (1993), by contrast, reaches the opposite conclusion. More recent studies continue to examine performance by analyzing the impact of costs (fees, turnover and expense ratios) and other mutual fund characteristics with findings that frequently contradict one another.² To explain these contradictory results, other studies such as Lehman and Modest (1987), Grinblatt and Titman (1989), Brown, Goetzmann, Ibbotson, and Ross (1992), Elton,

² Malkiel (1993, 1995) and Carhart (1997) document a negative impact for portfolio turnover and total fund expenses, while Grinblatt and Titman (1994) and Wermers (2000) find a positive relationship between performance and turnover. In another study, Hooks (1996) concludes that low expense load funds outperform average expense no-load funds, while Droms and Walker (1996) find no relation between performance and loads. Considering a number of performance factors, Prather, Bertin and Henker (2004) find expenses to be negatively related to performance and no relation between turnover and performance.

Gruber, Das, and Hlavka (1993), Grinblatt and Titman (1994), Malkiel (1995), Golec (1996), Elton, Gruber, and Blake (1996), Carhart (1997), Detzel and Weigand (1998), and Dellva, DeMaskey, and Smith (2001) attribute abnormal performance and persistence to the overstatement of returns resulting from survivorship bias and misspecification due to benchmark error.

The latest studies continue the performance discussion by considering a variety of fund and management specific features such as industry concentration, management structure, family cross-subsidization, mimicking top performing funds and market timing.³ Brown, Goetzmann and Liang (2004) examine funds of hedge funds citing some of the same potential advantages/disadvantages as noted above for FOFs. They find that the additional fees including high incentive fees leave funds of hedge funds with worse performance records than individual hedge funds. Although their hedge fund study is related, no prior mutual fund studies have systematically analyzed FOFs (funds that invest in traditional mutual funds). In addition to being the first examination of FOFs, our study contributes to the existing literature by comparing FOFs' performance relative to a sample of traditional equity mutual funds as well as to the overall market. We also analyze FOFs' performance in terms of fund management structure and provide a systematic approach for selecting the best FOFs.

2.1. FOFs growth trends

In 1996 *Morningstar Principia Mutual Funds Advanced (MS)* reported performance information for 55 multi-class equity FOFs.⁴ These funds were offered by 17 fund

³ See, for example, Kacperczyk, Sialm and Zheng (2005), Bär, Kempf and Ruenzi (2005), Gaspar, Massa and Matos (2006), Cohen, Coval and Pástor (2005) and Friesen and Sapp (2007).

⁴ Equity funds refer to the *MS* categorization of domestic and international equity funds. Multi-class funds hold the same investment portfolio across each class, but offer different shareholder rights and

families and accounted for approximately \$14.65 billion in mutual fund assets. At the end of 2003, the number of FOFs had grown to 526 offerings from 67 fund families with FOFs' assets totalling approximately \$85.32 billion. This represents a 28.6% annual growth rate in FOFs' assets over this seven-year period. In comparison, the number of multi-class equity funds across the same investment objective categories as the FOFs increased from 2,138 to 6,492 (with assets increasing from \$1.14 trillion to \$2.50 trillion) over the 1996-2003 period. This represents an 11.87% annual growth rate in assets, which is less than half that of the FOFs over the same period.

When compared to similarly classified equity funds, FOFs in 1996 accounted for approximately 1.3% of total mutual fund assets, but by the end of 2003 this proportion had grown to 3.4%. Several factors may be responsible for such an increase including performance and performance-related demand among investors resulting in an increased flow of funds. Additionally, as mutual fund companies attempt to meet increased demand, they may initiate new or expand upon existing FOFs' offerings (or in some cases proliferate their offerings to compete for fund flows). Finally, unrelated to performance, FOFs' growth and popularity may simply be due to the fact that they offer (or are perceived as offering) something different than the standard mutual fund.

In addition to these growth trends, we provide an initial overview of relative performance and cost structure of FOFs and traditional mutual funds over two distinct years, 1996 and 2003. Further analysis considers the eight-year period from 1996 to 2003 and includes an examination of the differential impact of FOFs' management

obligations typically related to fee structures. Common share classes are: A, depicting funds with front-end fees; B, for funds with deferred loads; C, indicating no sales charges, but relatively high annual 12b-1 fees.

structure and diversification strategies on fund performance. Additionally, we provide a detailed discussion of other unique features of FOFs that influence their desirability.

3. Descriptive statistics

To analyze fund composition, performance and cost structure, we compare our set of FOFs to two groups of equity funds including a broad group of equity funds and a subset of these funds with the same investment objectives as the sample of FOFs.⁵ Table 1 provides descriptive information for the FOFs and the equity fund samples. Focusing strictly on the FOFs, first in 1996 and then again in 2003, growth is apparent from the number of fund offerings (nearly a ten-fold increase) and the increase in total assets. Further, this growth occurs despite increasing loads.

When compared to the broad equity fund group and the equity subset, FOFs exhibit several distinguishing features. For example, Table 1 shows that FOFs are substantially smaller than their equity counterparts, which on a percentage basis could contribute to their larger annual total asset growth (approximately 29% annually compared to the 11% for equity funds and 12% for the equity subset over 1996 to 2003). In addition to performance as a driver for this growth differential, increased demand for and flows into FOFs is also a contributing factor. Table 1 further suggests that FOFs hold more funds that invest in smaller companies than the other two equity groups, as illustrated by the lower average median market capitalization measure. Finally, the average minimum initial purchase is significantly smaller for FOFs

⁵ The final sample of FOFs used for empirical analyses consists of funds with the following investment objectives (as defined by *MS*): aggressive growth, growth, growth and income, asset allocation, and balanced.

indicating that the two equity groups are comprised of funds requiring larger initial investments, perhaps targeting institutional investors.

When measuring FOFs' performance it should be noted that FOFs returns are net of not only their own asset-based expenses and fees, but also all expenses, fees, and loads charged by the individual funds in their portfolio. Table 1 reveals that FOFs on average carry a higher *Morningstar* rating, which is consistent with FOFs average three-year mean return exceeding that of the equity or the equity subset group of funds. These higher returns are accompanied by lower volatility suggesting that FOFs' risk-adjusted performance exceeds that of both traditional equity fund groups.

As indicated in the final section of Table 1, the cost structure of FOFs has changed dramatically since 1996. For example, by 2003 front-end fees and deferred loads had more than doubled while 12b-1 fees increased by 32%. Despite these increases in fees and loads, FOFs' expenses are still below those of the two equity groups. In addition, the expense ratio and turnover for FOFs have decreased from 1.16% to 0.82% and 72% to 49%, respectively, from 1996 to 2003. These figures are well below the expense ratio and turnover figures for the traditional equity fund groups, which have experienced increases in both of these cost categories over the same period.

In summary, FOFs differ in size, performance and cost structure when compared to traditional equity funds. Particularly appealing to investors may be the higher returns and lower volatility and costs associated with FOFs. In spite of the added layer of fees, FOFs are able to absorb these and in some cases provide enhanced risk-adjusted

performance. To further explore these casual observations, we provide a detailed statistical analysis of performance for both the FOFs' group and the equity subset.

4. Performance evaluation

4.1. Performance Analysis

The FOFs and the equity funds comparisons are based on two common risk-adjusted performance measures, which include Jensen's alpha (α) and the Sharpe ratio. These measures are estimated for each fund over the period 1996-2003. While the fund samples have been matched based on investment objective, we additionally control for allocation-based performance differences by estimating modified Jensen's alphas using a multi-factor version of the Capital Asset Pricing Model. The multi-benchmark model includes three different equity market factors and one bond market factor; large and small capitalization stock indexes, a foreign stock index and a bond index. These benchmarks capture the impact of the funds' differential holdings of large-cap, small-cap, foreign and bond investments.⁶ The model is specified as follows:

$$r_{pt} - r_{ft} = \alpha + \beta_{pL}(r_{Lt} - r_{ft}) + \beta_{pS}(r_{St} - r_{ft}) + \beta_{pF}(r_{Ft} - r_{ft}) + \beta_{pB}(r_{Bt} - r_{ft}) + \varepsilon_{pt} \quad (1)$$

where,

r_{pt} is the return on the fund being evaluated in period t ,
 r_{ft} is the return on the riskless asset in period t (3-month T-bill),
 β_{pj} is the sensitivity to benchmark j ,
 r_{jt} is the return on the benchmark in period t ,
 L is a large stock index (S&P 500),
 S is a small stock index (S&P 600),
 F is a foreign stock index (MSCI World),
 B is a bond index (Lehman Brother's LT Govt/Corp. Bond),
 ε_{pt} is the random error.

⁶ This multi-benchmark model is similar to that described in Elton, Gruber, Brown and Goetzmann (2003).

Jensen's alpha, the intercept term from the model, provides a measure of abnormal performance. The four indexes (S&P 500, S&P600, MSCI World and Lehman Brother's LT Government/Corporate Bond) are mutually exclusive in their constituents and cover the most commonly used benchmarks, thus minimizing the potential for benchmark error.

The Sharpe ratio measures risk-adjusted performance using a benchmark based on the ex-post capital market line. It is calculated as follows:

$$SR_p = (ar_p - ar_f) / \sigma_p \quad (2)$$

where,

$$\begin{aligned} ar_p &= \text{average monthly fund return}^7 \\ ar_f &= \text{average monthly risk-free return (3-month T-Bill)} \\ \sigma_p &= \text{standard deviation of the monthly returns for the fund} \end{aligned}$$

This ratio is calculated for each fund over the period 1996-2003.

For performance comparisons, the equity funds sample is the subset group of all equity funds with the same investment objectives (designated by *Morningstar*) as the FOFs' sample. Therefore, both the FOFs and equity subset samples include funds with the following investment objectives: aggressive growth, growth, growth and income, asset allocation and balanced. Both performance measures are calculated for each fund with a performance history of at least one year. This results in a sample consisting of 172 FOFs and 2,369 equity funds for a total of 2,541 funds holding distinct investment portfolios.⁸

⁷ For the FOFs, returns are net of asset-based expenses and fees, and all realized expenses, fees, and loads of the individual funds in their portfolio. For the equity fund subset, returns are net of all asset-based expenses and fees.

⁸ In cases where multi-class funds are offered, the final sample includes the share class with the longest operating history.

Table 2 reports the average alphas and coefficient estimates of the multi-benchmark model, and the average Sharpe ratios for FOFs and the equity fund subset. Also included in the table are test statistics comparing the two samples. Based on the performance measures, results indicate that the FOFs perform as well as, or better than the equity fund subset.⁹ The alpha estimates for both samples are negative and significantly different from zero, although the Wilcoxon two-sample test statistics indicate they are not significantly different from one another. Still the magnitude of the equity funds negative alpha is twice that of the FOFs' sample. A comparison of the Sharpe ratios provides further support with the FOFs outperforming the equity funds subset, and this difference is statistically significant. Overall, regardless of the measure used, the FOFs' performance compares favorably to the equity fund subset. This finding is in contrast to Brown, Goetzmann and Liang's (2004) hedge fund study where the funds of hedge funds significantly underperformed the individual hedge funds. This may be due to the fact that FOFs are not subject to the incentive fees that significantly erode the returns for the funds of hedge funds.

4.2. Model related performance considerations

As a robustness check we consider whether the multi-benchmark model adequately captures potential allocation-based performance differentials. To address this we construct three regressions that include the estimated alphas as the dependent variable, while investment objective and asset allocation serve as independent variables. Table 3, Panel A presents the specification of these regressions and reports the results. The first regression uses dummy variables for investment objectives and demonstrates that

⁹ The results are robust to the time period analyzed. Estimates were also generated for two non-overlapping subperiods, 1997-1999 and 2000-2002, which represent up-market and down-market periods, respectively. The subperiod results are consistent with the overall results for the entire period and thus are not reported separately.

except for growth funds, all other fund categories outperformed the aggressive growth funds since all of the coefficients are positive and significantly different from zero.¹⁰ The second regression considers asset allocation variables, while the third regression includes both asset allocation and investment objective variables. The results from both of these regressions indicate that the asset allocation coefficient estimates are not significant. This provides reasonable evidence that the alpha estimates are not the result of systematic asset allocation differences with the multi-benchmark model (Equation 1) adequately accounting for the different market factor loadings.

Previous literature documents mixed results regarding the impact of fund specific variables like turnover, expense ratio and fund age on performance.¹¹ To address their potential impact we analyze three regressions with the estimated alphas as the dependent variable and fund specific variables as independent variables along with FOFs and investment objective dummy variables. Panel B of Table 3 presents the specification of these regressions and also indicates that turnover, expense ratios and fund age negatively impact performance.

After accounting for investment objectives and fund specific variables, the coefficient estimate for the FOFs' dummy variable is not significant. This is consistent with our general findings that FOFs cover their additional layer of fees since their risk-adjusted, after expense performance is on par with that of the traditional equity funds. Despite the insignificant coefficient for the FOFs' dummy, FOFs are typically younger and have lower turnover and expense ratios than the average equity fund. In

¹⁰ The aggressive growth (AG) dummy variable is included in the intercept of the model.

¹¹ While Malkiel (1993, 1995) and Carhart (1997) document that performance is negatively related to portfolio turnover, Grinblatt and Titman (1994) and Wermers (2000) find a positive relationship. In regard to fund age, Malhotra and Mcleod (1997) find expense ratios are negatively related to age, yet Prather, Bertin and Henker (2004) find age does not significantly impact performance.

light of these qualities, we examine the sample further to establish a systematic approach for selecting FOFs.

4.3 Management structure and performance

Advocates of FOFs hype their ability to provide access to top quality managers and to achieve risk reduction through fund manager and fund company diversification. The potential advantage of management diversification is obvious assuming that managers' performance records are not perfectly correlated. Finance theory would suggest that by holding a portfolio of funds with different managers, poor performance by one manager can be offset by another's good performance. Along these lines, Fant and O'Neal (1999) document substantial risk reduction benefits associated with diversification across fund managers. Although a similar diversification argument can be made at the fund company level, holding different companies' funds may also expand the range of investment opportunities. Additionally, FOFs that invest across different fund companies may provide monitoring services. Theory further suggests that FOFs' managers, in their capacity as monitors, reduce potential inefficiencies arising from agency problems between fund managers and fund owners. Thus, agency costs (the added layer of fees and expenses) are borne by investors to compensate FOFs' managers for the oversight function they provide.

Given the relative performance of FOFs, we empirically examine the potential sources of gains, such as diversification (fund companies/managers) and/or management expertise (monitoring/informational advantages). As previously reported in Table 1, the lower standard deviation of returns reported for FOFs implies diversification

benefits. To consider the alternative explanation of management expertise, the following analyses focus on Sharpe ratio comparisons within the FOFs' sample.¹²

The *MS* database provides information regarding management structure so that funds may be categorized as follows: funds managed by an individual, funds managed by an identified team (typically fewer than 4 individuals), or unidentified, team-managed funds. In the FOFs' sample we are able to identify the management structure for 160 funds with 60 of the funds being individually managed, 32 managed by identified teams and 68 having unidentified team-managers. If performance is purely due to diversification benefits, then management structure should have no impact on our results. Alternatively, if management expertise adds value, then we may observe performance differentials.

To report the performance comparisons for these groups, we construct a three-by-three matrix based upon the different management structures. Utilizing this matrix format, Table 4 reports the Sharpe ratios and significance tests for comparisons of management structure within the FOFs' sample. The Sharpe ratios and the number of funds within each management category are listed along the diagonals of the Table, and the Wilcoxon signed-rank test statistics for comparing managers are listed on the off-diagonals. The average monthly ratio is highest for the funds managed by individuals and lowest for the unidentified team-managed funds. The ratios for the two groups of funds with identified managers (individual and team) are 0.0751 and 0.0484, respectively, and the null hypothesis of equal means cannot be rejected. The

¹² Eling and Schuhmacher (2007) find the Sharpe ratio rankings of fund performance are virtually identical to a wide array of other performance measures. Further, our sample FOFs' holdings are highly diversified with FOFs typically holding an average of 18 traditional funds, and those funds hold an average of 170 individual securities.

Sharpe ratio for the unidentified team-managed funds however, is 0.0202, resulting in the rejection of the null hypothesis of equal means when comparing this group to the identified team-managed group.

These results suggest benefits beyond simple manager diversification or company diversification as better performance is achieved by those funds that specifically designate and identify their managers. Since identified teams may be directly responsible for the FOFs' performance, their reputations are at stake. This provides the motivation to use their management expertise in selecting fund managers and fund companies, as well as evaluating the economy, industry and firms in which the selected funds invest. Thus, we find enhanced performance for these identified team managers who provide more than naïve diversification. In contrast, fund companies that offer funds with unidentified managers may be attempting to capitalize on the demand for FOFs by creating a product that simply combines their existing funds. In doing so, these FOFs merely offer naïve diversification with no specialized management expertise, and their performance is significantly worse. Baer, Kempf and Ruenzi (2006) find a negative relationship between team management and fund performance, however, they do not differentiate between identified and unidentified teams. In contrast, our stratification based on identification of team managers allows us to capture the differential impact of those FOFs putting their names on the line versus those that are merely creating a popular product.

To address the benefits of diversification across fund companies, management expertise, and/or monitoring that reduces the potential agency conflict, the following discussion and analysis compares the performance of FOFs that invest in-family to

those that invest out-of-family. While FOFs investing out-of-family can offer diversification at both the manager level and fund company level, funds investing in-family can only offer diversification at the fund manager level. Our sample clearly demonstrates that FOFs offer diversification across mutual fund managers as only three cases exist where a FOFs' manager has invested in traditional funds solely under his/her own management. Diversification across different fund companies, however, is less apparent as 135 of the FOFs invest in-family and only 34 invest outside of the fund family.¹³

Table 5 presents the average monthly Sharpe ratios for comparing the performance of the two distinct groups of FOFs. The average monthly ratio for the in-family group is 0.1108, which is significantly different from zero and larger than that of the out-of-family group at -0.0040. According to the Wilcoxon signed-rank test, the performance differential between the two groups is statistically significant indicating the desirability of FOFs that invest in-family.

Although this finding seems contrary to the notion of diversification and monitoring benefits, the dominance of in-family performance may result from asymmetric information regarding in-house fund managers. FOFs that invest in-house may be privy to inside information that would not be available to the FOFs' managers investing out-of-family. Thus the diversification and monitoring benefits of investing out-of-family are more than offset by the losses associated with asymmetric information, although in most cases investing out-of-family is a function of limited in-

¹³ In-family FOFs are categorized as having the majority of investments in traditional funds offered by their own company, while out-of-family FOFs invest in traditional funds outside the FOFs' company. For this part of the analysis, we are able to categorize a total of 169 of the original 172 FOFs in the sample.

house availability of mutual funds.¹⁴ In-family FOFs also have the support of larger fund complexes, such that investing in-house could provide certain cost advantages not available to outsiders, including full or partial waiver of expenses, fees and loads.¹⁵ Thus, holding funds through a FOFs' investment can actually reduce overall costs, as Table 1 shows FOFs' average cost structure is lower than that of traditional equity funds. This finding is consistent with the results of Gaspar, Massa and Matos (2006), which document cross-fund subsidization within mutual fund families.

The next analysis considers whether management structure has an impact on performance between in-family and out-of-family FOFs. We are able to identify management structure for 129 of the 135 in-family FOFs and 31 of the 34 in the out-of-family group. Table 6 contains the Sharpe ratios for both groups classified by individual managers, identified team managers and unidentified team managers. For the in-family FOFs, individual, identified-team, and unidentified team managed funds have ratios of 0.1067, 0.0416 and 0.0338, respectively. While this performance measure for the individually managed funds is larger than the other groups, we cannot reject the null hypothesis of equal means. These results suggest that in-family versus out-of-family investment decisions are more important than management structure in determining FOFs' performance. For the 31 funds that invest out-of-family, 15 are individually managed, 5 have team-identified structures and 11 are unidentified team managed, and their Sharpe ratios are -0.0196 , 0.0854 and -0.0503 , respectively.¹⁶

¹⁴ For the out-of-family sample, the families provide on average 19 fund offerings compared to 120 offerings for the in-family FOFs.

¹⁵ Fund companies may offer this as a marketing tool to encourage predictable flows into the traditional funds within the family. Additionally, fund companies that offer financial advisory services may find it more efficient to put smaller investors into FOFs to reduce costs associated with reviewing and rebalancing portfolios.

¹⁶ Given the small number of funds within each category, statistical tests of equal means are not conducted.

Thus, the FOFs that invest out-of-family with unidentified team management structures exhibit the worst performance.

A final analysis compares the performance of the FOFs to the equity fund subset. Table 7 reports the Sharpe ratios and Jensen's alphas for both the in-family and out-of-family FOFs and also for the equity funds. The comparisons provide evidence that the in-family FOFs not only keep pace with the traditional funds, but that they also exhibit superior performance (approximately 10% significance level). By contrast the Sharpe ratio for the out-of-family FOFs is significantly below that of the traditional funds. These results support the prior findings that those FOFs investing in-family are the preferred choice not only among FOFs, but also among mutual funds in general.¹⁷

Based on the superior performance of in-family FOFs, the logical extension is to increase returns by replicating a FOFs' portfolio with a hypothetical "do-it-yourself" strategy in an attempt to avoid the additional layer of fees and expenses. In theory, replication is possible given that *Morningstar* provides complete listings of mutual funds' holdings, however, in practice, three potential barriers to implementing of such a strategy emerge. The first is the magnitude of the investment required to replicate a FOFs' portfolio, while the second barrier arises when funds held by the FOFs are closed to either additional investment or new investors. Even for those FOFs that invest in open funds not restricted to investor type, minimum initial purchase requirements could serve as a third barrier to effective replication.

¹⁷ Although this study does not correct for survivor bias, we find a 3-year mortality rate of 4.3% for FOFs compared to the 5.4% rate that Malkiel (1995) reports for general equity funds. This suggests that the impact of survivor bias is greater for the non-FOFs sample, which would inflate their returns relative to the FOFs sample. Hence, a correction for survivor bias would serve to reinforce our results.

Given that FOFs' allocation is across traditional funds with a wide range of minimum initial investments (as little as a zero dollar investment to over \$1 million), the replication of a FOFs' portfolio may require large outlays. For the sample of FOFs analyzed in this study, the average median investment required to duplicate a FOFs' holdings is over \$500,000 with some funds requiring more than \$50 million to replicate. By contrast minimum initial investments for most FOFs are generally low, as Table 1 indicates the median minimum initial purchase for the average FOFs is just \$1,000.

FOFs also offer the investor the opportunity to invest in funds that have been closed to new investment. Prior studies including Zhao (2004), Manakyan and Liano (1997) and Smaby and Fazel (1995) have documented that funds typically close to new investment after having experienced superior performance and that investors chase the returns of funds with past superior performance. Closed funds frequently cite the need to restrict fund flows in order to maintain a successful investment strategy and justify their closures based on this argument. For those investors wishing to purchase shares in the pursuit of the superior performance of closed funds, FOFs provide them with this opportunity.

Finally, FOFs are able to reduce or eliminate the impact of loads on performance. Loads are usually determined on a sliding scale that decreases as a function of dollars invested. For the typical load fund, front-end or deferred loads range between zero and 5.75% with Table 1 reporting average front-end and deferred loads at approximately 1%. Since FOFs typically invest in large dollar amounts, they can

avoid loads altogether and thus achieve cost efficiencies that are unobtainable by small-scale investors.

5. Summary and Conclusions

This paper examines the rapidly growing category of mutual funds known as FOFs, which are unique in that they invest in other mutual funds rather than individual securities. These differences allow us to compare the overall performance of FOFs to that of traditional mutual funds and examine the potential impact of management structure and fund company diversification upon performance. We also consider the feasibility of providing the same FOFs' benefits through a hypothetical "do-it-yourself" strategy of investing in multiple mutual funds.

The findings suggest that the rapid growth in FOFs is warranted, since their performance compares favorably to that of traditional mutual funds, and they provide a cost effective method for diversification. Our results further indicate that enhanced performance can be attributed to diversification across fund managers, management expertise and cost efficiencies as opposed to fund company diversification.

Additionally, FOFs with individual or identified team managers outperform their unidentified team-managed counterparts. Comparing FOFs to traditional equity funds with similar investment objectives, we find that a systematic approach of selecting FOFs that invest in-family leads to superior performance. Finally, duplication of a FOFs' investment portfolio on an individual level is virtually impossible, since FOFs frequently hold funds with high minimum initial investments, as well as funds closed to new investors.

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Table 1 - Descriptive statistics for FOFs and traditional equity funds

Portfolio characteristics, performance and cost variables in the years 1996 and 2003 for three groups of mutual funds: fund of funds (FOFs), equity funds and a subset of equity funds with the same investment objectives as the FOFs (figures are averages unless otherwise noted).

| | Fund of Funds | | Equity Funds | | Equity Fund Subset | |
|----------------------------------|---------------|---------------|---------------|---------------|--------------------|---------------|
| | 1996 | 2003 | 1996 | 2003 | 1996 | 2003 |
| Total Assets | \$14.65 (bil) | \$85.32 (bil) | \$1.70 (tril) | \$3.56 (tril) | \$1.14 (tril) | \$2.50 (tril) |
| Number of Funds* | (55) | (526) | (4,103) | (11,011) | (2,138) | (6,492) |
| <u>Portfolio Characteristics</u> | | | | | | |
| Med. Mkt. Cap. (mil) | \$9,008 | \$14,823 | \$7,762 | \$18,785 | \$10,355 | \$23,957 |
| Total Holdings (#)** | NMF | 18 | 139 | 165 | 132 | 170 |
| Min. Purchase (median) | \$1,000 | \$1,000 | \$1,000 | \$1,000 | \$1,000 | \$1,000 |
| Min. Purchase | \$3,063 | \$231,415 | \$169,349 | \$916,783 | \$201,902 | \$921,190 |
| <u>Performance</u> | | | | | | |
| PE | 25.8 | 17.8 | 25.4 | 19.6 | 25.2 | 19.4 |
| σ (3-yr)(%) | 8.51 | 12.38 | 12.41 | 19.56 | 11.49 | 18.17 |
| 3-yr. Mean Return*** | 11.49 | -0.3 | 12.9 | -2.01 | 14.64 | -3.5 |
| MS rating (3-yr.) | 3.0 | 3.26 | 3.03 | 2.96 | 3.15 | 2.97 |
| <u>Cost Structure</u> | | | | | | |
| Front-end Fees (%) | 0.49 | 1.01 | 1.46 | 1.11 | 1.44 | 1.11 |
| Deferred Load (%) | 0.38 | 0.86 | 0.88 | 0.97 | 0.83 | 0.96 |
| 12b-1 Fees (%) | 0.25 | 0.33 | 0.37 | 0.42 | 0.35 | 0.41 |
| Expense Ratio (%) | 1.16 | 0.82 | 1.54 | 1.58 | 1.40 | 1.45 |
| Turnover (%) | 72 | 49 | 84 | 121 | 90 | 170 |

* These numbers consider all multi-class funds within each group. The results presented in the remainder of the paper consider only those funds in each group with distinct investment portfolios. Thus, the samples used in the performance comparisons consist of 172 FOFs and 2,369 traditional equity funds.

** For FOFs, the median number of funds held; for equity funds, the average number of securities held

*** For all funds, returns are net of asset-based expenses and fees. For the FOFs, the returns are also net of loads assessed by the traditional funds.

Table 2

Performance analysis

This table includes Jensen's alphas and beta estimates for the multi-benchmark model and the Sharpe ratios for the 172 FOFs and 2,369 equity funds from 1996-2003. For the multi-benchmark model, the estimates for the betas are denoted as: L for the large stock index, S for the small stock index, B for the bond index and F for the foreign stock index. Also included is the Wilcoxon two-sample test statistic comparing the mean coefficient estimates of the FOFs sample and the equity fund subset.

$$\text{Modified Jensen's } \alpha: r_{pt} - r_{ft} = \alpha + \beta_{pL}(r_{Lt} - r_{ft}) + \beta_{pS}(r_{St} - r_{ft}) + \beta_{pB}(r_{Bt} - r_{ft}) + \beta_{pF}(r_{Ft} - r_{ft}) + \varepsilon_{pt}$$

$$\text{Sharpe ratio: } SR_p = (ar_p - ar_f) / \sigma_p$$

| | FOFs | Equity Fund Subset | t-statistic |
|--------------|----------------------|----------------------|----------------------|
| α | -0.0004 ⁺ | -0.0008 ⁺ | 1.15 |
| β_{pL} | 0.38 ⁺ | 0.62 ⁺ | -9.74 ^{***} |
| β_{pS} | 0.19 ⁺ | 0.28 ⁺ | -0.66 |
| β_{pB} | 0.09 ⁺ | 0.02 ⁺ | 8.65 ^{***} |
| β_{pF} | 0.13 ⁺ | 0.04 ⁺ | 9.32 ^{***} |
| Sharpe ratio | 0.08 ⁺ | 0.07 ⁺ | 2.49 ^{***} |
| N | 172 | 2369 | |

coefficients different from zero

+++ 1% significance

++ 5% significance

+ 10% significance

coefficients different across fund samples

*** 1% significance level

** 5% significance level

* 10% significance level

Table 3

Analysis of the model: Investment objective, fund composition and characteristics

This table contains regression model results using Jensen's alphas as dependent variables. The independent variables are fund objective dummies (AG=aggressive growth, AA=asset allocation, BA=balanced, GR=growth, GI=growth and income), composition (cash, equity, bonds and other) and characteristics (turn = turnover, exprat = expense ratio and age).

Panel A: Regressions are specified as follows:

$$1) \alpha = a + \sum_{i=1}^4 b_i \text{iobj}_i + \varepsilon, \quad 2) \alpha = a + \sum_{i=1}^4 b_i \text{alloc}_i + \varepsilon, \quad 3) \alpha = a + \sum_{i=1}^4 b_i \text{iobj}_i + \sum_{i=5}^8 b_i \text{alloc}_i + \varepsilon$$

| Dep. Var. | Intercept ^a | AA | BA | GR | GI | Cash% | Equity% | Bonds% | Other% |
|-------------|------------------------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|
| 1) α | -0.0020*** | 0.0021** | 0.0018** | 0.0007 | 0.0036*** | | | | |
| 2) α | 0.0085 | | | | | -0.0125 | -0.0094 | -0.0061 | -0.0087 |
| 3) α | 0.0055 | 0.0035*** | 0.0028*** | 0.0032*** | 0.0037*** | -0.0127 | -0.0095 | -0.0062 | -0.0089 |

Panel B: Regressions are specified as follows:

$$1) \alpha = a + b_0 \text{FOF} + \varepsilon, \quad 2) \alpha = a + b_0 \text{FOF} + \sum_{i=1}^4 b_i \text{iobj}_i + \varepsilon, \quad 3) \alpha = a + b_0 \text{FOF} + \sum_{i=1}^4 b_i \text{iobj}_i + b_5 \text{turn} + b_6 \text{exprat} + b_7 \text{age} + \varepsilon$$

| Dep. Var. | Intercept ^a | FOF | AA | BA | GR | GI | turn | exprat | age |
|-------------|------------------------|---------|-----------|-----------|----------|-----------|------------|------------|------------|
| 1) α | -0.0008*** | 0.0004 | | | | | | | |
| 2) α | -0.0020*** | -0.0002 | 0.0021** | 0.0018** | 0.0007 | 0.0036*** | | | |
| 3) α | -0.0030 | -0.0013 | 0.0026*** | 0.0025*** | 0.0014** | 0.0040*** | -0.0006*** | -0.1059*** | -0.00003** |

^a the estimated intercept includes the AG funds.

***, **, * denote significance at 1%, 5% and 10% levels, respectively.

Table 4

Performance measures for FOFs as a function of management structure

For the sample of 160 FOFs based on management structure (individual, identified team and unidentified team), the average monthly Sharpe ratios are reported along the diagonals with the number of funds in each group in parentheses. The off-diagonals include the Wilcoxon z -statistics and p -values used to compare differences in the Sharpe ratios for individual versus identified team, individual versus unidentified team and identified team versus unidentified team.

| | Individual | Identified Team Man. | Unidentified Team Man. |
|---------------------------------|----------------|---|---|
| Individual Manager | 0.0751 (60) | $z = 1.0288$ $p\text{-value} = (0.1518)$ | $z = 0.9812$ $p\text{-value} = (0.1632)$ |
| Identified Team Management | | 0.0484 (32) | $z = 2.3091$ $p\text{-value} = (0.0105)$ |
| Unidentified Team Management | | | 0.0202 (68) |

Table 5

Fund company diversification and performance evaluation

This table includes average monthly Sharpe ratios, standard deviations and ANOVA test statistics. The Wilcoxon signed rank test statistics are also included to compare the performance of 135 FOFs that invest in-family to that of the 34 FOFs that invest out-of-family.

| | Sharpe ratio | St. Dev. | ANOVA test statistics | | Wilcoxon test statistics | | N |
|--------------------|--------------|----------|-----------------------|-----------------|--------------------------|-----------------|-----|
| | | | <i>z</i> | <i>p</i> -value | <i>F</i> | <i>p</i> -value | |
| In-Family FOFs | 0.1108 | 0.3094 | 4.16 | <0.0001 | 1.8137 | 0.0349 | 135 |
| Out-of-family FOFs | -0.0040 | 0.1001 | -0.2355 | 0.8153 | | | 34 |

Table 6

Performance comparisons: In-family versus out-of-family FOFs and management structure

This table reports Sharpe ratios, standard deviations and test statistics for comparing the impact of management structure (individual, identified team, unidentified team) on FOFs that invest in-family and FOFs that invest out-of-family.

Panel A: 129 In-Family FOFs

| | Sharpe ratio | St. Dev. | <i>t</i> | <i>p</i> -value | N |
|---------------------------------|--------------|----------|----------|-----------------|----|
| Individual Managers (IND) | 0.1067 | 0.2556 | 2.80 | 0.0076 | 45 |
| Identified Team-Managed (IDT) | 0.0416 | 0.1059 | 2.04 | 0.0518 | 27 |
| Unidentified Team-Managed (UNT) | 0.0338 | 0.1332 | 1.92 | 0.0602 | 57 |

Wilcoxon signed-rank tests

| | | | | | |
|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| $H_0: SR_{IND} = SR_{IDT}$ | $z = 0.0582$ | $H_0: SR_{IND} = SR_{UNT}$ | $z = 1.0244$ | $H_0: SR_{IDT} = SR_{UNT}$ | $z = 1.1302$ |
| $H_a: SR_{IND} > SR_{IDT}$ | $p\text{-value} = 0.4768$ | $H_a: SR_{IND} > SR_{UNT}$ | $p\text{-value} = 0.1528$ | $H_a: SR_{IDT} > SR_{UNT}$ | $p\text{-value} = 0.1292$ |

Panel B: 31 Out-of-Family FOFs

| | Sharpe ratio | St. Dev. | <i>t</i> | <i>p</i> -value | N |
|---------------------------------|--------------|----------|----------|-----------------|----|
| Individual Managers (IND) | -0.0196 | 0.0952 | -0.7971 | 0.4387 | 15 |
| Identified Team-Managed (IDT) | 0.0854 | 0.0332 | 5.7531 | 0.0045 | 5 |
| Unidentified Team-Managed (UNT) | -0.0503 | 0.0987 | -1.6894 | 0.1220 | 11 |

Table 7

Performance comparisons for FOFs and the equity fund subset

This table compares the performance of the in-family and out-of-family FOFs' performance to that of the equity fund subset using both Sharpe ratio and Jensen's alpha as performance measures and also reports test statistics.

| | <u>FOFs</u> | <u>Equity Fund Subset</u> | <u>Wilcoxon Z</u> | <u>p-value</u> |
|----------------------|-------------|-------------------------------|-------------------|----------------|
| <u>In-family</u> | | | | |
| Sharpe ratio | 0.1108 | 0.0410 | 0.9667 | 0.1668 |
| Jensen's alpha | -0.0003 | -0.0008 | 1.2437 | 0.1068 |
| <u>Out-of-family</u> | | | | |
| Sharpe ratio | 0.0040 | 0.0410 | 2.1789 | 0.0147 |
| Jensen's alpha | -0.0008 | -0.0008 | 0.0402 | 0.4840 |